



OM-1532

045 099D

March 1994

Processes

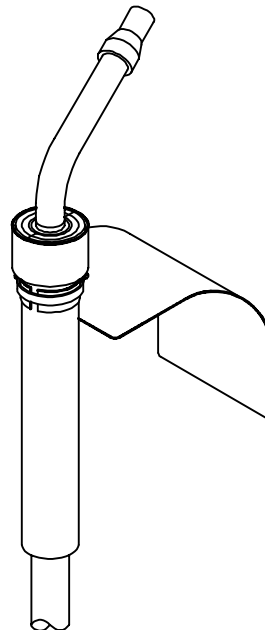


Flux Cored (FCAW) Welding

Description

Air-Cooled Gun

GA-50GL



Visit our website at
www.MillerWelds.com

OWNER'S MANUAL

From Miller to You

Thank you and congratulations on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've

made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.



SAFETY PRECAUTIONS FOR GMAW GUNS



WARNING

GMAW WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.

In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information found in the wire feeder and welding power source Owner's Manuals. Read and follow all safety precautions.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

	<p>ELECTRIC SHOCK can kill.</p> <ol style="list-style-type: none"> 1. Always wear dry insulating gloves. 2. Insulate yourself from work and ground. 3. Do not touch live electrode or electrical parts. 4. Repair or replace worn, damaged, or cracked gun or cable insulation. 5. Turn off welding power source before changing contact tip or gun parts. 6. Keep all covers and handle securely in place. 		<p>ARC RAYS can burn eyes and skin.</p> <ol style="list-style-type: none"> 1. Wear welding helmet with correct shade of filter. 2. Wear correct eye and body protection. 3. Cover exposed skin with spatter-resistant clothing.
	<p>FUMES AND GASES can be hazardous to your health.</p> <ol style="list-style-type: none"> 1. Keep your head out of the fumes. 2. Ventilate area, or use breathing device. 3. Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used. 		<p>HOT SURFACES can burn skin.</p> <ol style="list-style-type: none"> 1. Allow gun to cool before touching. 2. Do not touch hot metal. 3. Protect hot metal from contact by others.
	<p>WELDING can cause fire or explosion.</p> <ol style="list-style-type: none"> 1. Do not weld near flammable material. 2. Do not weld on closed containers. 3. Watch for fire; keep extinguisher nearby. 		<p>NOISE can damage hearing; SOME APPLICATIONS, SUCH AS PULSING, are noisy.</p> <ol style="list-style-type: none"> 1. Check for noise level limits exceeding those specified by OSHA. 2. Use approved ear plugs or ear muffs if noise level is high. 3. Warn others nearby about noise hazard.
			<p>WELDING WIRE can cause puncture wounds.</p> <ol style="list-style-type: none"> 1. Keep hands and body away from gun tip when trigger is pressed.

EMF INFORMATION

NOTE



Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): "... there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

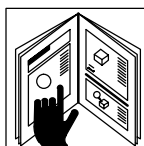
About Pacemakers:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

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SECTION 1 – SAFETY INFORMATION

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- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.

WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Disconnect input power before installing or servicing.

CAUTION

MOVING PARTS can injure.

- Keep away from moving parts.
- Keep all panels and covers closed when operating.

1 Safety Alert Symbol

2 Signal Word

WARNING means possible death or serious injury can happen.

CAUTION means possible minor injury or equipment damage can happen.

3 Statement Of Hazard And Result

4 Safety Instructions To Avoid Hazard

5 Hazard Symbol (If Available)

6 Safety Banner

Read safety blocks for each symbol shown.

7 NOTE

Special instructions for best operation – not related to safety.

WARNING

READ SAFETY BLOCKS at start of Section 3-1 before proceeding.

NOTE

Turn Off switch when using high frequency.

Figure 1-1. Safety Information

SECTION 2 – SPECIFICATIONS

Table 2-1. Welding Gun

Specifications	Description
Rated Output	500 Amperes, DC Electrode Positive (DCEP)
Duty Cycle	100%
Wire Diameter	1/16 Thru 1/8 in (1.6 Thru 3.2 mm) Flux Cored Wires
Cable Length	15 ft (4.5 mm)
Weight	Net: 14 lb (6.4 kg); Ship: 16 lb (7.3 kg)

2-1. Duty Cycle

CAUTION

WELDING LONGER THAN RATED DUTY CYCLE can damage gun and void warranty.

- Do not weld at rated load longer than shown below.

Minutes

Definition

Duty Cycle is percentage of 10 minutes that gun can weld at rated load without overheating.

100% Duty Cycle At 500 Amperes

Continuous Welding

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Figure 2-1. Duty Cycle

SECTION 3 – INSTALLATION

3-1. Preparing And Installing Gun

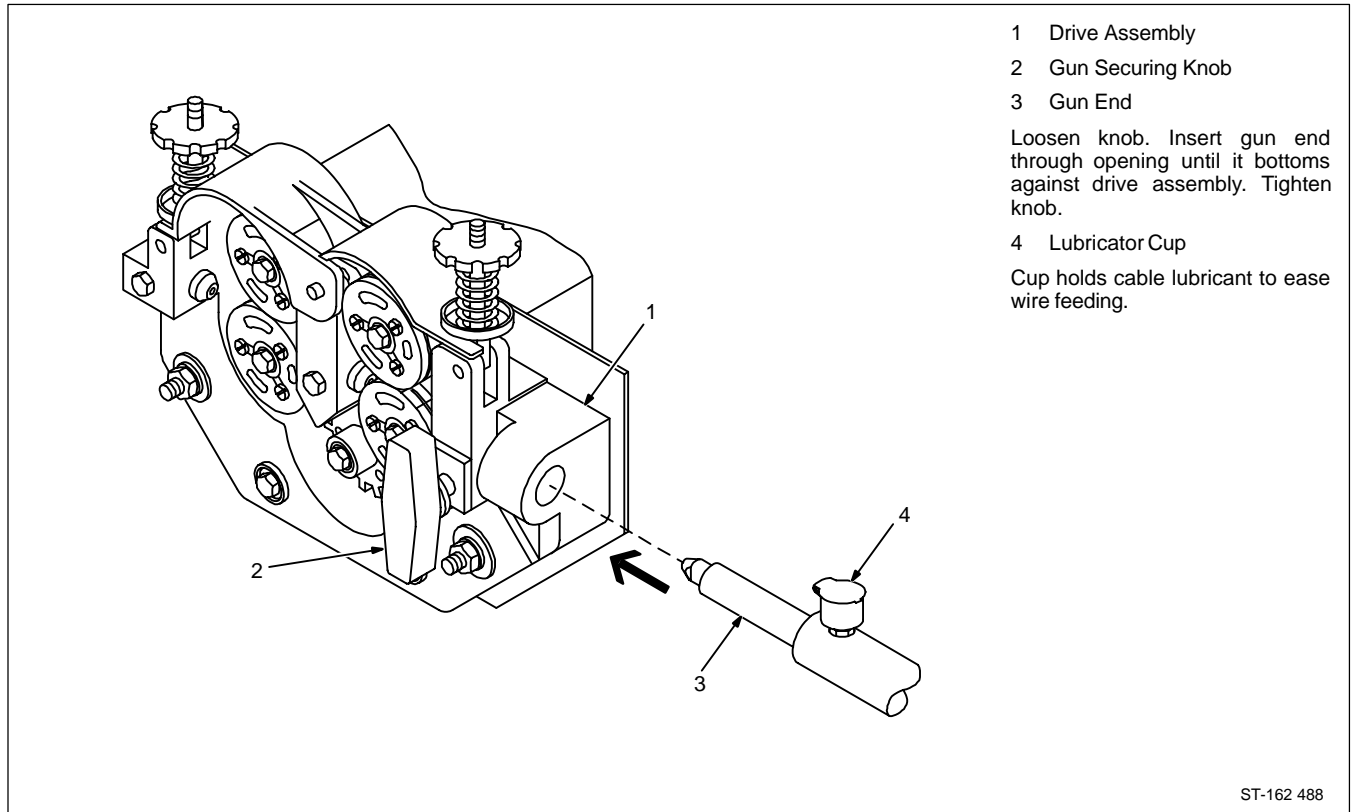


Figure 3-1. Installing Gun

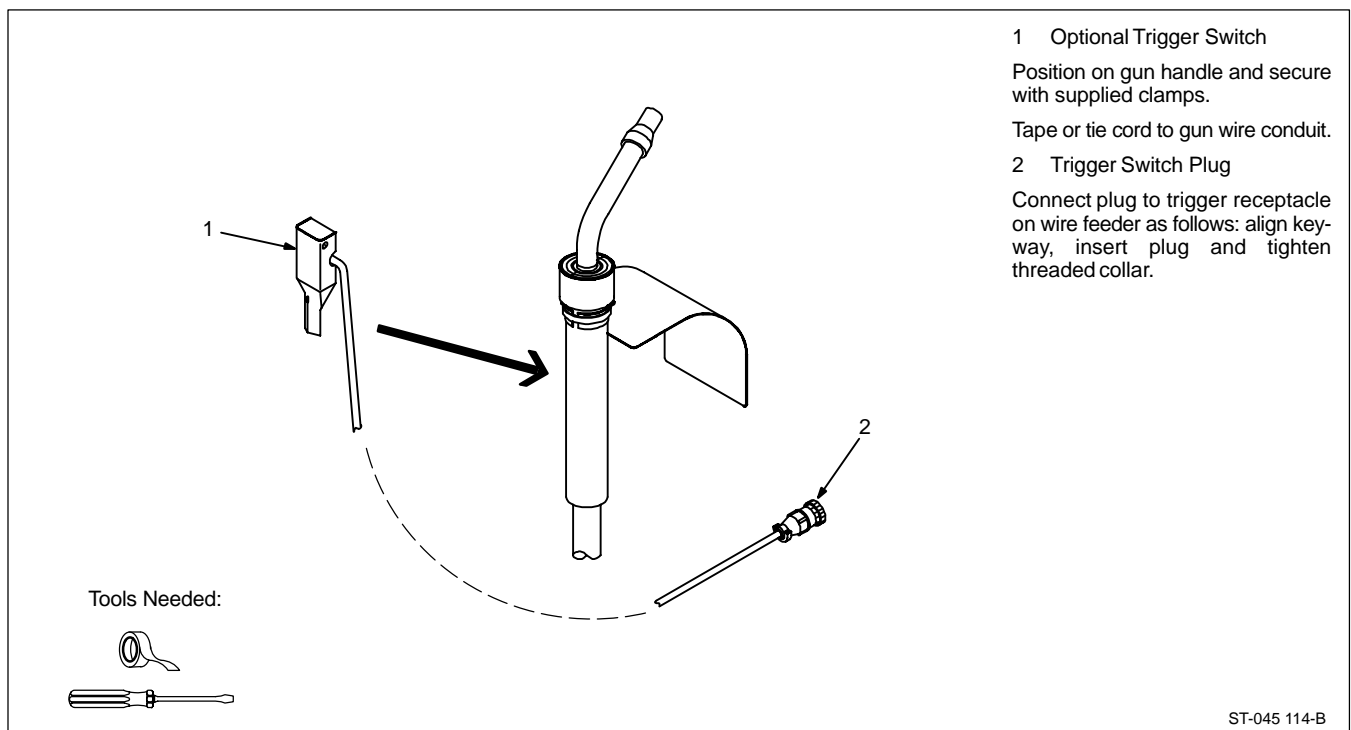


Figure 3-2. Optional Trigger Switch Installation

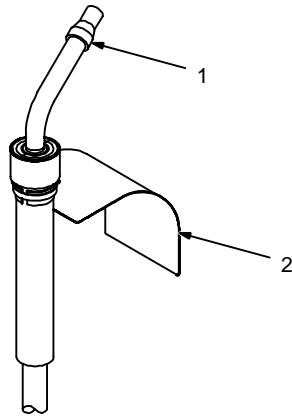
SECTION 4 – OPERATION

WARNING



READ SAFETY BLOCKS at beginning of manual before proceeding.

4-1. Operating The Gun



1 Thread Protector

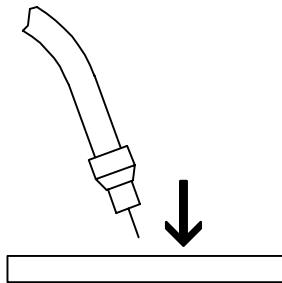
Remove and replace with optional nozzle if desired.

2 Hand Guard

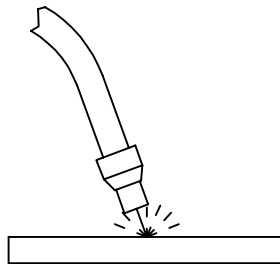
Protects hand holding gun from heat and spatter while welding.

Welding wire is electrically energized when the welding power source contactor is on. Touch welding wire to workpiece to start welding. Pull gun away from weld to stop welding.

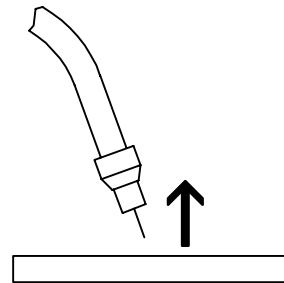
When an optional trigger switch is installed, place the welding wire on the workpiece and press the trigger switch to start welding. Release switch to stop welding.



Start



Weld



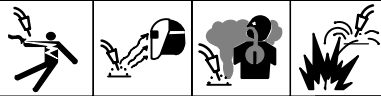
Stop

Ref. ST-045 114-A / ST-800 025

Figure 4-1. Gun Operation

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

WARNING



READ SAFETY BLOCKS at beginning of manual before proceeding.

5-1. Maintenance And Troubleshooting

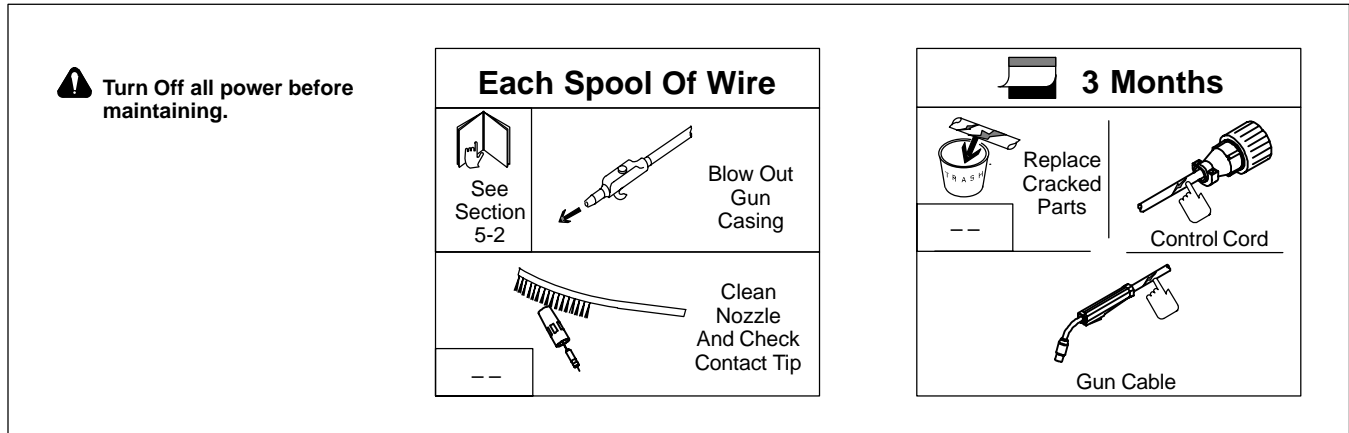
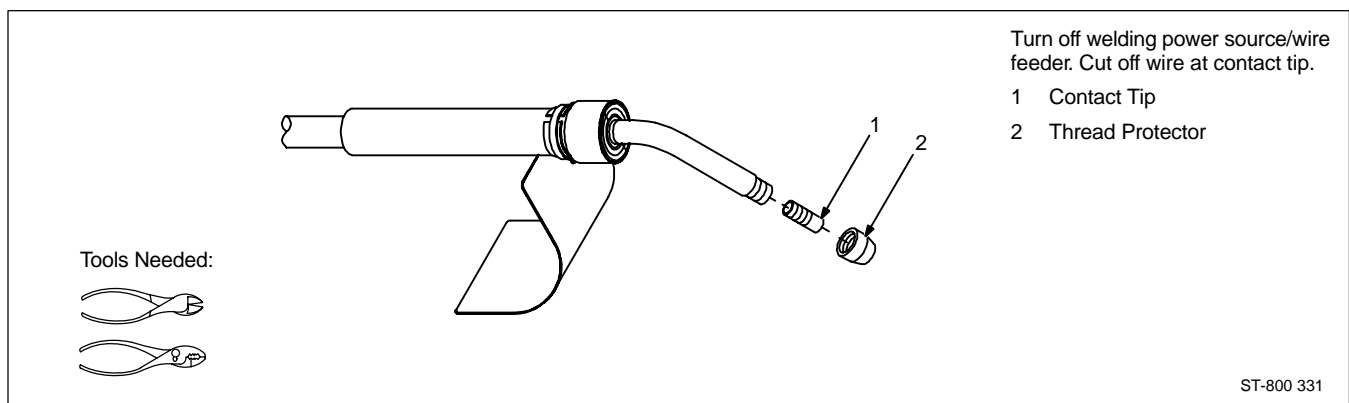


Figure 5-1. Routine Maintenance

Table 5-1. Troubleshooting

Trouble	Remedy
Wire does not feed.	Check contact tip. Check for kinks in gun cable. Check connections at welding power source/wire feeder. Have nearest Factory Authorized Service Station/Service Distributor check gun trigger switch.
Wire is not energized.	Check contact tip. Check connections at welding power source/wire feeder. Have nearest Factory Authorized Service Station/Service Distributor check gun trigger switch.
Wire feeds unevenly.	Check contact tip. Check for kinks in gun cable. Blow out liner and gun casing.

5-2. Changing Contact Tip And Liner



ST-800 331

Figure 5-2. Changing Contact Tip



CAUTION

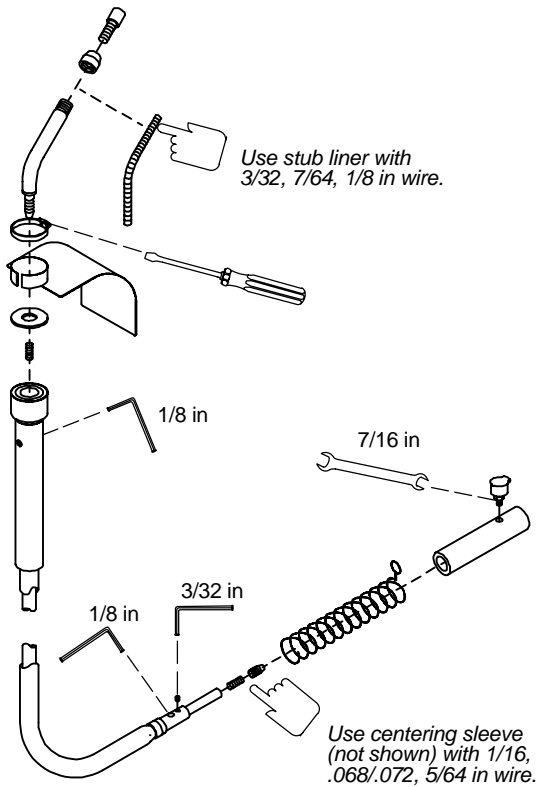
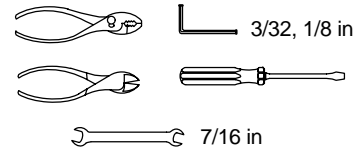
FLYING METAL CHIPS AND DIRT can cause injury and damage equipment.

- Point gun away from people and in a safe direction when blowing out with compressed air.



Turn off welding power source/wire feeder.

Tools Needed:



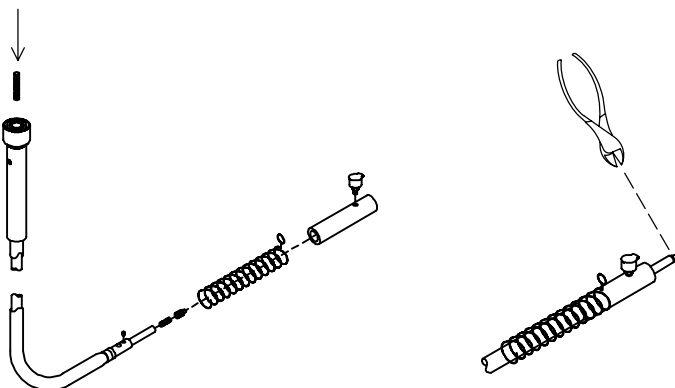
Pull liner from this end if using 1/16, .068/.072, 5/64 in wire.

Pull liner from this end if using 3/32, 7/64, 1/8 in wire.

Disassemble Gun

Remove Liner

Blow Out Gun Casing



To Reassemble Gun:

Reassemble gun in reverse order of disassembly.

Be sure monocoil liner butts against stub liner (if used).

Be sure slot in centering sleeve (if used) is aligned with lubricating cup.

Do not overtighten setscrews.

Cut liner off flush with wire outlet guide.

ST-800 330-B

Figure 5-3. Changing Liner

SECTION 6 – PARTS LIST

Available Wire Sizes

Millimeters	1.6	1.8	2.0	2.4	2.8	3.2
Inches (decimal)	.063	.068/.072	.078	.094	.109	.125
Inches (fractions)	1/16		5/64	3/32	7/64	1/8

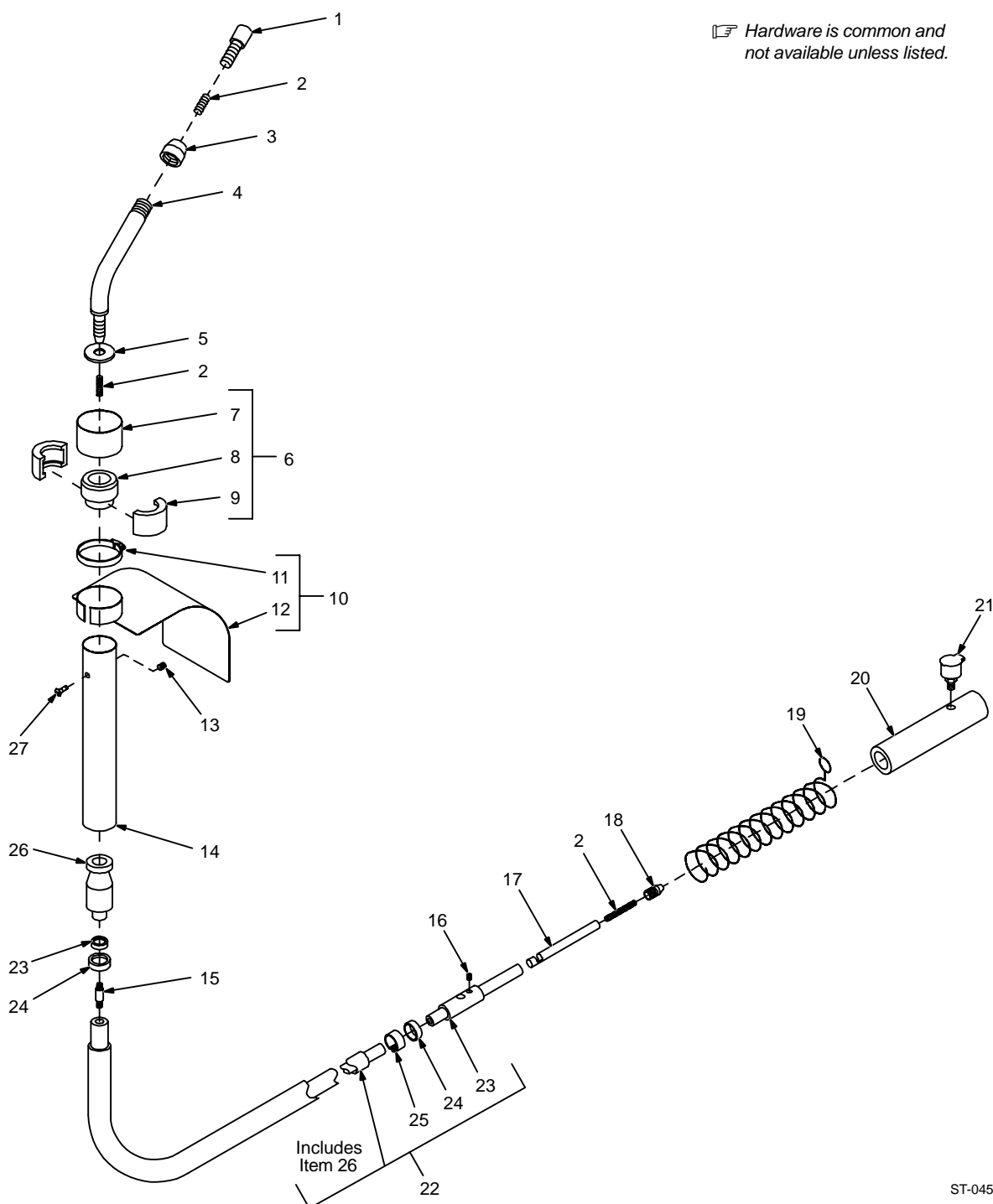


Figure 6-1. GA-50GL Gun

ST-045 113-C

Item No.	Part No.	Description	Quantity
Figure 6-1. GA-50GL Gun			
1	009 709	TIP, cont scr 1/16 wire x 1.125	1
1	090 922	TIP, cont scr .072 wire x 1.125	1
1	052 055	TIP, cont scr 5/64 wire x 1.125	1
1	008 926	TIP, cont scr 3/32 wire x 1.125	1
1	008 925	TIP, cont scr 7/64 wire x 1.125	1
1	008 924	TIP, cont scr 1/8 wire x 1.125	1
2	008 931	LINER, monocoil 3/32-1/8 wire x 7.250	1
3	046 017	PROTECTOR, thread	1
4	046 018	TUBE, head 60deg	1
5	008 932	INSULATOR, handle	1
6	075 625	KIT, connector head tube (consisting of)	1
7	075 855	INSULATOR, nut head tube	1
8	075 626	NUT, head tube	1
9	078 981	RING-HALF, gun	2
10	008 948	GUARD w/CLAMP, shield hand (consisting of)	1
11	010 860	CLAMP, hose .812-1.750clp dia	1
12	008 928	GUARD, shield hand	1
13	602 178	SCREW, set .250-20 x .375knrl pt sch stl	1
14	075 628	HANDLE, gun	1
15	114 974	LINER, monocoil 1/16-5/64 wire x 11ft 6 in	1
15	114 973	LINER, monocoil 1/16-5/64 wire x 16ft 8 in	1
15	088 759	LINER, monocoil 3/32-1/8 wire x 15ft 6 in	1
16	605 789	SCREW, set 10-24 x .250 cup pt sch stl	1
17	134 601	SLEEVE, centering monocoil	1
18	134 600	GUIDE, wire outlet 1/16-5/64	1
18	079 851	GUIDE, wire outlet 3/32-1/8	1
19	095 949	SPRING, cprsn w/protective end cap	1
20	075 644	INSULATOR, body lubricator	1
21	073 357	CUP, lubricator	1
22	048 826	CABLE/CONDUIT, 15ft (consisting of)	1
23	048 825	ADAPTER, gun/feeder	1
24	004 733	CLAMP, cable conduit	2
25	004 732	CLAMP, cable conduit	2
26	004 729	ADAPTER, head tube/power cable	1
27	078 894	SCREW, .250-20 x .375 flathd-slt stl	1
	♦046 013	NOZZLE, screw 1.750 lg	1
	♦046 014	NOZZLE, screw 2.375 lg	1
	♦085 210	ADAPTER, gun/feeder .045	1
	♦047 729	ADAPTER, gun/feeder 1/16-5/64	1
	♦047 771	ADAPTER, gun/feeder 3/32-1/8	1
	♦076 123	COMPOUND, cable lubricant 7 oz bottle	1
	♦079 854	TRIGGER SWITCH, (consisting of)	1
	079 878	CONNECTOR & PINS, (consisting of)	1
	079 535	CONNECTOR, circ pin push-in 14-18ga Amp 66359-6	4
	048 834	CONNECTOR, circ clamp str rlf sz 11 Amp 206062-4	1
	604 525	CABLE, port No. 18 2/c (order by ft)	17ft
	151 914	SWITCH, lim 10A 125/250VAC plunger actr SP	1
	059 258	BLOCK, mtg switch	1
	153 132	STRAIN RELIEF, cable	1
	059 294	SPRING, cprsn .210 OD x .026 wire x .625	1
	056 845	HOUSING, switch torch	1
	057 171	LEVER, actuating switch	1
	059 293	RIVET, stl .218dia x 1.250 lg	1
	059 290	NUT, speed push-on-type .156 stud .320 ID x .437 OD	1
	010 497	CLAMP, hose .660-1.750clp dia	1

♦ OPTIONAL

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

[illegible]

TRUE BLUE[®]

WARRANTY

Effective January 1, 2000
(Equipment with a serial number preface of "LA" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives
you ...

Service

You always get the fast,
reliable response you
need. Most replacement
parts can be in your
hands in 24 hours.

Support

Need fast answers to the
tough welding questions?
Contact your distributor.
The expertise of the
distributor and Miller is
there to help you, every
step of the way.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
 - * Original main power rectifiers
 - * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
 - * Transformer/Rectifier Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Semi-Automatic and Automatic Wire Feeders
 - * Inverter Power Supplies
 - * Intellitig
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
 - * DS-2 Wire Feeder
 - * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
 - * Process Controllers
 - * Positioners and Controllers
 - * Automatic Motion Devices
 - * RFCS Foot Controls
 - * Induction Heating Power Sources
 - * Water Coolant Systems
 - * HF Units
 - * Grids
 - * Maxstar 140
 - * Spot Welders
 - * Load Banks
 - * Miller Cyclomatic Equipment
 - * Running Gear/Trailers
 - * Plasma Cutting Torches (except APT & SAF Models)
 - * Field Options
(NOTE: Field options are covered under True Blue[®] for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
 - * MIG Guns/TIG Torches
 - * Induction Heating Coils and Blankets

- * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- * Remote Controls
- * Accessory Kits
- * Replacement Parts (No labor)
- * Spoolmate 185 & Spoolmate 250
- * Canvas Covers

Miller's True Blue[®] Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.



Owner's Record

Please complete and retain with your personal records.

Model Name

Serial/Style Number

Purchase Date

(Date which equipment was delivered to original customer.)

Distributor

Address

City

State

Zip



For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Technical Manuals (Servicing Information and Parts)

Circuit Diagrams

Welding Process Handbooks

Contact the Delivering Carrier for:

File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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